REMARKS

Applicants respectfully request reconsideration. By this amendment, Applicants hereby amend claim 45 without disclaimer or prejudice. No claims have been canceled or added. As a result, claims 45-47, 52, and 94-100 are still pending for examination with claim 45 being an independent claim. Basis for the amendment can be found throughout the specification. No new matter is added.

IDS

A first IDS was submitted on January 31, 2007. A second IDS is submitted herewith.

Rejection Under 35 U.S.C. 112

Claims 45-47, 52 and 94-100 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. The Examiner performed a Wands analysis.

Working Examples and Guidance in the Specification

The Examiner stated that "[n]o working example of the claimed method is provided" and that "[t]he specification provides no guidance regarding a single method that treats or eliminates tumors and cancer of all types in a subject. There are no figures or actual data demonstrating the claimed method." (Office Action, page 3, third and fourth paragraphs.)

Applicants respectfully disagree to the extent that this rejection is maintained over the amended claims. In the specification, Applicants have taught that oligonucleotides containing an unmethylated CpG dinucleotide produce an immune response that is consistent with the treatment of cancer. Applicants have taught routes of administration. Applicants have provided numerous examples of oligonucleotides falling within the genus of molecules recited in the claims. Significant amounts of data demonstrating the effects of CpG oligonucleotides are provided in the specification. The data confirms the effectiveness of the claimed motif by showing that oligonucleotides having an unmethylated CpG dinucleotide are capable of inducing an immune response whereas oligonucleotides having the same sequence of nucleotides but a methylated C instead of an unmethylated C lose activity.

In the specification, Applicants have demonstrated that oligonucleotides containing an unmethylated CpG are effective at stimulating B-cell proliferation (Table 1), IgM secretion (page 24, IL-6 production (pages 22-26, and Tables 3-4), induction of TNF-α (pages 26-29, and Tables 5-7), induction of IL-12 (pages 26-27, and Table 5), induction of IFN-γ (pages 26-29, and Tables 5-6), induction of GM-CSF (pages 27-29, and Tables 5-7), and induction of NK Cell Stimulatory Activity (pages 32-35, and Tables 8-10). The description and the data found in the specification establish a pattern of immune stimulation which is consistent with the treatment of cancer. The data is sufficient to establish to one of skill in the art that this class of molecules is sufficient to promote an immune response which helps the host body's immune system attack the cancer.

One distinction between Applicants' invention and other immune-related treatments reported for cancer is that the CpG nucleic acids of the invention act by stimulating an immune response in a host without acting as a vaccine: CpG nucleic acids of the invention are not tumor associated antigens (TAAs). Applicants submit that an immune response stimulated by a CpG nucleic acid of the invention, in a subject having cancer, is useful to attack the cancer and produce a therapeutic result. In contrast, cancer vaccines are designed to elicit a response to a specific antigen associated with cancer as described in more detail in Bodey et al. (Anticancer Research 20, 2665-2676, (2000)) cited by the Examiner. The teachings of Bodey et al. are discussed in more detail below.

State of the Prior Art and Predictability in the Art

The Examiner stated that "[a]t the time the invention was made, there was no known cure to cancer." The Examiner cited Bodey et al. for the teaching that "given the known "constant microevolution" of tumor cells, there is no way one could predict which immunostimulatory nucleic acid molecule would lead to the desired effect (elimination of cancer or tumors) or what changes in activity might result by the tumor cells."

However, as mentioned above, Bodey et al. is a review article that summarizes numerous studies performed on cancer vaccines and their effects on immune stimulation and potential use as therapeutics. Applicants respectfully submit that the cited teachings of Bodey et al. do not relate to the therapeutic potential and utility of the presently claimed CpG nucleic acids for treating cancer.

A significant amount of discussion in Bodey is directed to different antigens expressed in cancer cells. Applicants submit that the "constant microevolution" reported on page 2673 of Bodey et al., and referred to on page 3 of the Office Action, is described in the context of vaccine therapies based on tumor antigens. The same paragraph of Bodey et al. (see the bottom of page 2673 through the top of page 2674) reports that the "[u]se of cancer vaccines to stimulate the immune system may be in vain, if the particular TAAs represented in the vaccine preparation are no longer present on the most advanced subsets of cancer cells."

In contrast, the presently claimed invention relates to nucleic acids that promote an immune response which helps the host body's immune system attack a tumor or cancer. The nucleic acids recited in the pending claims are not vaccines, but they promote a pattern of immune stimulation described above that is consistent with the claimed treatment of cancer.

Therefore, Applicants submit that the cited teachings of Bodey et al. do not undermine the predictability of the present invention.

Amount of Experimentation Necessary

The Examiner also addressed the amount of experimentation necessary. According to the Examiner, "it would require undue experimentation of one skilled in the art to use the claimed methods." The Examiner again points to Bodey et al. and cites the following statement: "The use of cancer vaccines seems, at present, destined to remain limited to their employment as adjuvants to both traditional therapies and in the management of minimal residual disease following surgical resection of the primary cancer mass." (Office Action, page 4, second paragraph.)

Applicants disagree. Applicants again submit that the present invention is not based on a cancer vaccine as described above. In addition, Applicants have taught in the specification a class of compounds that is useful for treating cancer. Exemplary doses and routes of administration are provided. The class of compounds includes oligonucleotides having an unmethylated CpG dinucleotide. Methods are known in the art for synthesizing oligonucleotides containing this CpG motif. Oligonucleotides can be purchased from numerous commercial sources. The oligonucleotide once synthesized could be administered to a subject having cancer, as is currently being performed in on-going human clinical trials. It is unclear to Applicants why the

experimentation required to perform the method would be considered to be undue. One of skill in the art would simply need to follow the guidance provided in the specification using a class of molecules that can be obtained commercially or easily synthesized.

Accordingly, withdrawal of the rejection of claims 45-47, 52, and 94-100 under 35 U.S.C. §112 is respectfully requested.

CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Dated: August 13, 2007

Respectfully submitted,

By Patrick H Waller

Patrick R. H. Waller
Registration No.: 41,418
WOLF, GREENFIELD & SACKS, P.C.
Federal Reserve Plaza
600 Atlantic Avenue
Boston, Massachusetts 02210-2206
(617) 646-8000

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